

# PATENT SPECIFICATION

NO DRAWINGS

**L062.796**

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Int. Cl.:—A 63 b 53/04//B 05 c

## COMPLETE SPECIFICATION

### Improvements relating to Metal Heads of Golf Clubs

We DUNLOP RUBBER COMPANY LIMITED, a British Company of 1, Albany Street, London N.W.1., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the metal driving faces of heads of golf clubs and particularly to the ball contacting sections which are usually grooved with depressions running approximately at right angles to the club handle along the face of the club.

Normally a large proportion of the driving face is sand blasted to impart a matt finish. This finish, namely the grooved and the matt surface is required to impart back spin to the driven golf ball so that the ball may be lofted in flight and allow the player to control the run of the ball on landing. Furthermore the roughened surface of the face under normal conditions tends to stop the skidding of the golf ball on impact. However the desirable features arising from the roughened or matt finish driving surface on the face of the club head are short lived in that the face quickly becomes polished with use or play.

It is thus the object of this invention to provide a surface coating for the driving face of the golf club head that will have a high co-efficient of friction so as to prevent skidding, impart back spin to the driven ball and that will not readily polish in a manner comparable with the conventional metal club heads.

There is provided according to the present invention a golf club having a metal head, the driving surface of which has bonded to it by means of adhesive a friction and/or abrasive coating.

The invention also provides a process for

improving the driving surface of the metal head of a golf club which comprises bonding to said surface by means of an adhesive a friction and/or abrasive coating. The abrasive coating may comprise abrasive material embedded or adhered in an adhesive coating or a friction coating adhered to the driving surface of the head. The coating may be in sheet form. For example the friction or abrasive material may be cast or moulded in sheet form and the sheet adhered to the driving surface.

The abrasive material may consist of any one or a mixture of powdered silicon carbide, carborundum, silica, pumice, glass, garnet and like material of a suitable grain size. It is preferred that the grain size be of the order of 100—200 B.S.S. mesh. The adhesive used to bond the abrasive material to the metal driving face can be, for example, an epoxy resin, phenolic resin, epoxy/polysulphide rubber composition, epoxy/phenolic resin, polyurethane, chlorinated rubber, carboxylated rubber, or polyvinyl butyral or formal/phenolic resin. The friction coating may comprise, for example, a polymeric composition, for example, natural rubber, styrene-butadiene rubber, silicone rubber, neoprene, chlorosulphonated polyethylene, nitrile rubber, carboxylated polymer, or a phenolic or epoxy resin with or without a polysulphide rubber. Furthermore, polyvinyl formal or butyral resins with or without a phenolic resin are suitable as friction coatings. The polysulphide rubbers referred to are conveniently those sold under the Trade Mark "Thiokol".

The adhesive used to bond the friction coating to the driving face can be, for instance, either in solution or film form.

The abrasive type of surface may be applied to the metal driving face by any of the well known and conventional techniques used in metal adhesion such as (a) mixing an abrasive

material with an adhesive material and applying it to the prepared metal surface or (b) applying one or more coats of adhesive material to the prepared metal surface and dusting or pouring the powdered abrasive material on to the non-dry or wet surface of the adhesive material, the excess abrasive material being removed after the adhesive is cured or set. The abrasive material can be cast or moulded into a plastics sheet which is applied to the driving face with a suitable adhesive. The invention is illustrated in the following Examples.

#### EXAMPLE 1

This Example describes the application of a friction coating to the driving surface of a golf club head.

(a) The surface to which the friction coating was to be applied was first sandblasted.

(b) The sandblasted surface was degreased with trichloroethylene and allowed to dry. The surface was not handled after degreasing before the application of the coating.

(c) The coating material, an epoxy resin (EPON 828) was mixed with the required quantity of catalyst, tris-(dimethylamino methyl)phenol. The catalyst may be used at a concentration of 3—20% based on the epoxy resin used, but in the case of tris(dimethylamino methyl)phenol 6% is the preferred quantity based on the epoxy resin used. The mixture was applied to the prepared driving surface of the club head, to which it adhered. Although this coating may be air cured, curing was accelerated by placing the club head in an oven at slightly elevated temperatures. This cured coating was found to act satisfactorily as a friction surface for the above-mentioned purposes.

Alternative catalysts for low temperature curing are, for example, tetra ethylene pentamine and tri ethylene tetramine. Other catalysts such as phthalic anhydride or phenylene diamine may be used, but with these catalysts curing is generally effected by baking at elevated temperatures.

#### EXAMPLE II

This Example describes the application of an abrasive coating to the driving surface of a golf club head.

The surface was prepared and the coating material was applied to it in the same manner as in Example I. However, before the coating was cured powdered carborundum was dusted over the wet surface of the catalysed epoxy resin. The coating was then cured as in Example I and excess carborundum was removed after curing.

As alternatives to carborundum, garnet, glass, pumice, emery or a mixture of two

or more of these may be dusted or poured over the wet surface of the coating. The abrasive material is preferably of a consistency 190—200 B.S.S.

Such an abrasive coating is found to impart to the driving surface of the golf club head a high coefficient of friction, a non-skid surface and improved ability to impart back spin to a golf ball.

#### WHAT WE CLAIM IS:—

1. A golf club having a metal head the driving surface of which has bonded to it by means of adhesive a friction and/or abrasive coating.

2. A golf club according to claim 1, wherein the friction coating is selected from polymeric compositions such as compositions of natural rubber, styrene-butadiene rubber, silicone rubber, neoprene, chloro-sulphonated polyethylene, nitrile rubber, carboxylated polymers, phenolic and epoxy resins with or without polysulphide rubbers and polyvinyl formal or butyral resins with or without the addition of phenolic resins.

3. A golf club according to claim 1, wherein the abrasive material in the abrasive coating is selected from powdered carborundum, silica, pumice, glass and garnet, or a mixture of two or more of these materials.

4. A golf club according to claim 1 or 3, wherein the adhesive used for bonding the abrasive material to the driving surface is selected from epoxy resins, phenolic resins, epoxy polysulphide rubber compositions, epoxy phenolic resins, formal phenolic resins, polyurethanes, chlorinated rubbers, carboxylated rubbers and polyvinyl butyral resins.

5. A process for improving the driving surface of the metal head of a golf club, which comprises bonding to said surface by means of adhesive a friction and/or abrasive coating.

6. A process according to claim 5, which comprises applying an adhesive coating to said surface and embedding or adhering an abrasive material in said adhesive coating.

7. A process according to claim 5, which comprises casting or moulding the friction and/or abrasive material in sheet form and adhering the sheet to the driving surface.

8. A process according to Claim 5, substantially as hereinbefore described.

9. A process according to Claim 5, substantially as described in Example I or II.

10. A golf club whose driving face has been improved by the process of any of Claims 5—9.

11. A golf club according to Claim 1, substantially as hereinbefore described.

C. H. BOWYER

Agent for the Applicants.

Ecully, le 19 Novembre 2003

BV/NP/8187/03

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**ENTREE EN PHASE REGIONALE DEVANT L'OEB**

Demande internationale **PCT/FR 02/02130**

Publiée sous le n° **WO 03/00426**

Déposée le : **20 Juin 2002**

Au nom de : **TEXTILES ET PLASTIQUES CHOMARAT**

N/Dossier : **C2-B-18.264 EP**

Messieurs,

Par la présente, nous confirmons l'ordre de règlement des taxes relatives à l'entrée en phase régionale de la demande internationale PCT devant l'OEB, agissant en qualité d'office élu.

De fait, les taxes listées ci-après sont à prélever sur notre compte OEB n° 280 400 46 :

- taxe de dépôt ;
- taxes de désignation des Etats (7) ;
- taxe d'examen à hauteur de 50 % seulement en application de l'Article 12(2) du Règlement relatif aux taxes ;
- taxe pour la troisième annuité.

La taxe de recherche n'est pas acquittée compte-tenu de l'établissement du Rapport de Recherche International par l'OEB (JO OEB 1-2 1994).

./

Nous vous prions de trouver ci-joint un bordereau 1010 de règlement des taxes appropriées.

Nous vous prions de croire, Messieurs, en l'assurance de nos sentiments les meilleurs

**Bruno VUILLERMOZ**

Ecully, le 19 Novembre 2003

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**Bruno VUILLERMOZ**

Ecully, le 22 Octobre 2003

BV/NP/7533/03

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BP 5818

Patentlaan 2

2280 HV RIJSWICK - LA HAYE

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- Une copie du Rapport d'Examen Préliminaire International ;
- une requête (EPO Form 1200) ;
- photocopie de notre courrier adressé à l'OEB Munich (bureau caisse et comptabilité) :
  - lettre d'explication,
  - bordereau de taxes 1010.

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**Bruno VUILLERMOZ**

Ecully, le 22 Octobre 2003

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